

Block Diagram of Tree System

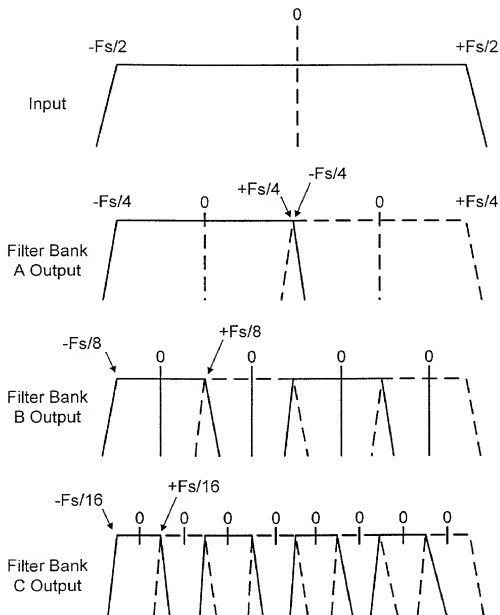
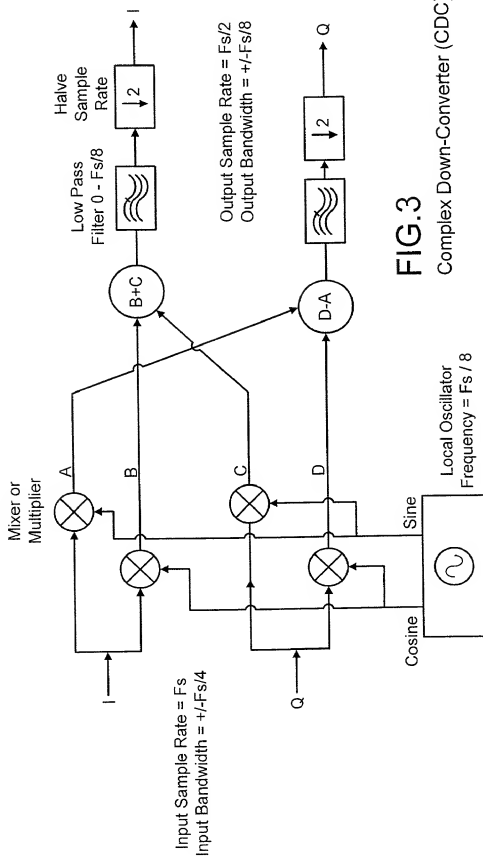


FIG.2

Frequency Band Splitting

**FIG.3**

Complex Down-Converter (CDC)

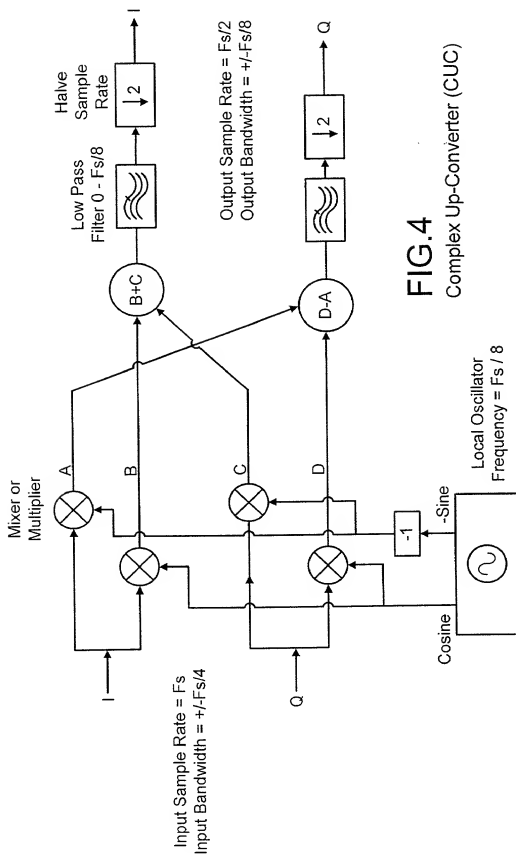


FIG.4
Complex Up-Converter (CUC)

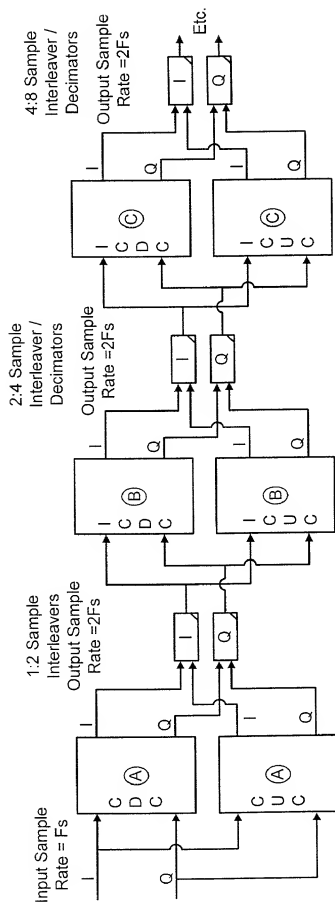


FIG.5

Block Diagram of Interleaved System

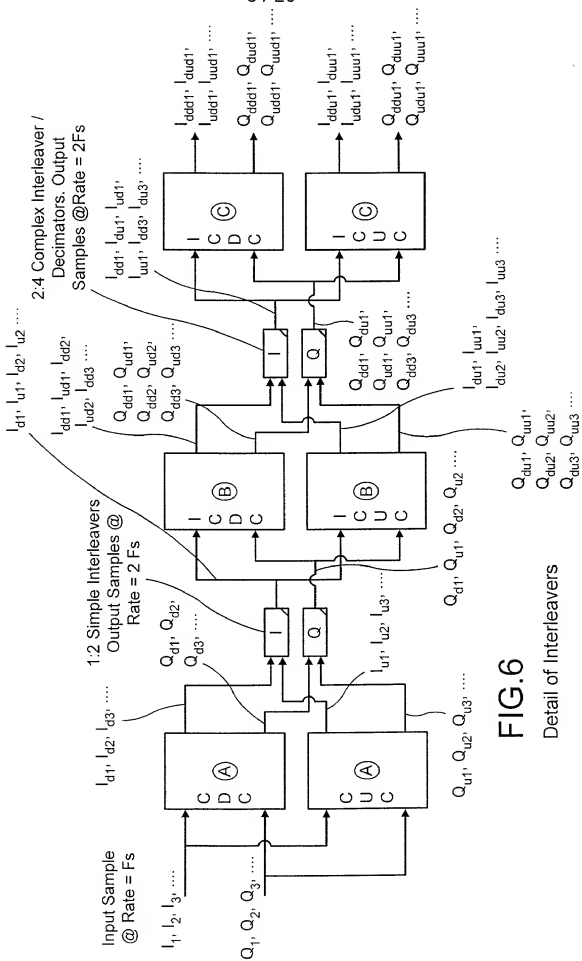


FIG.6

Detail of Interleavers

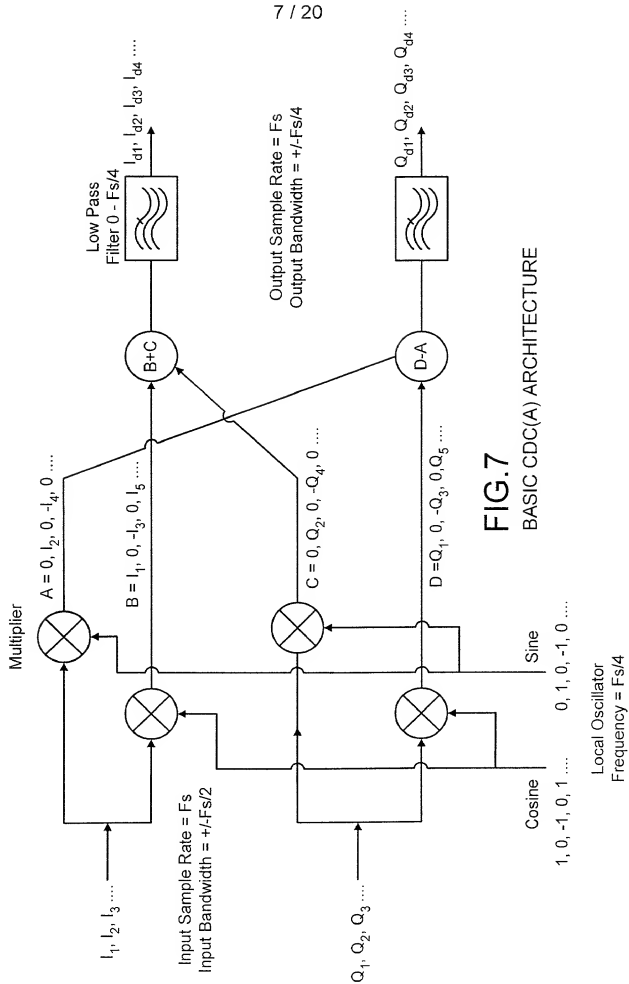


FIG.7
BASIC CDC(A) ARCHITECTURE

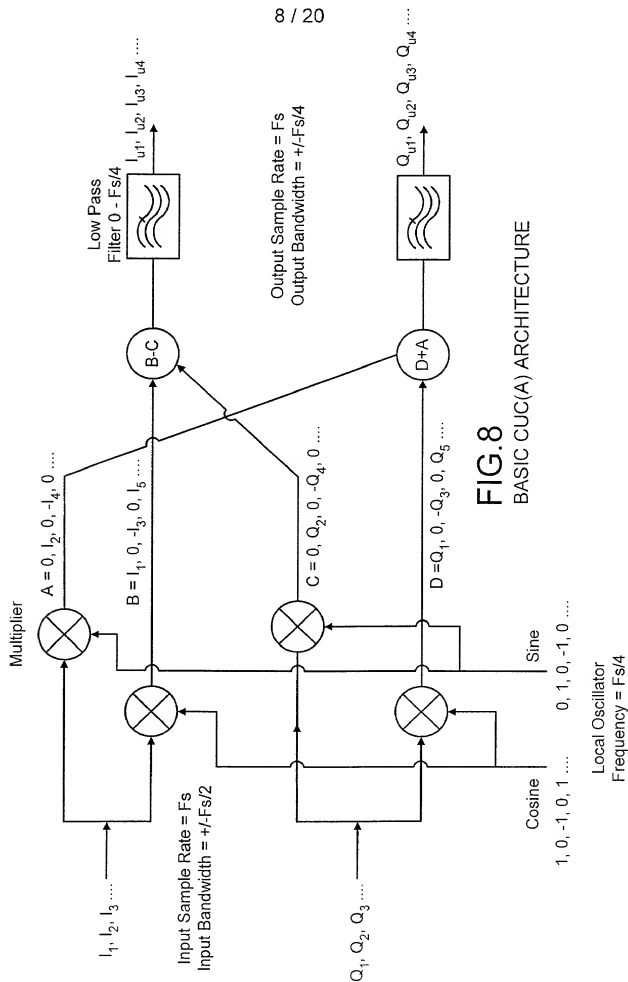


FIG.8

BASIC CUC(A) ARCHITECTURE

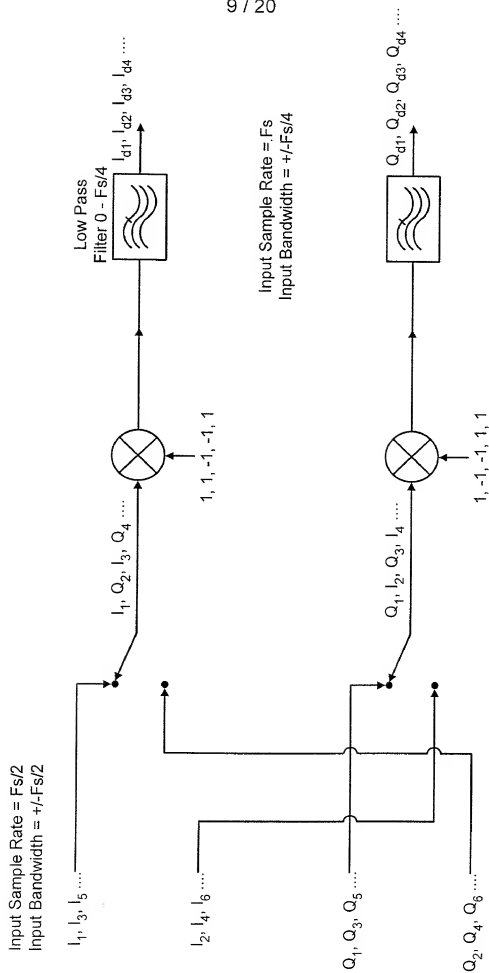


FIG.9
MODIFIED CDC(A) ARCHITECTURE

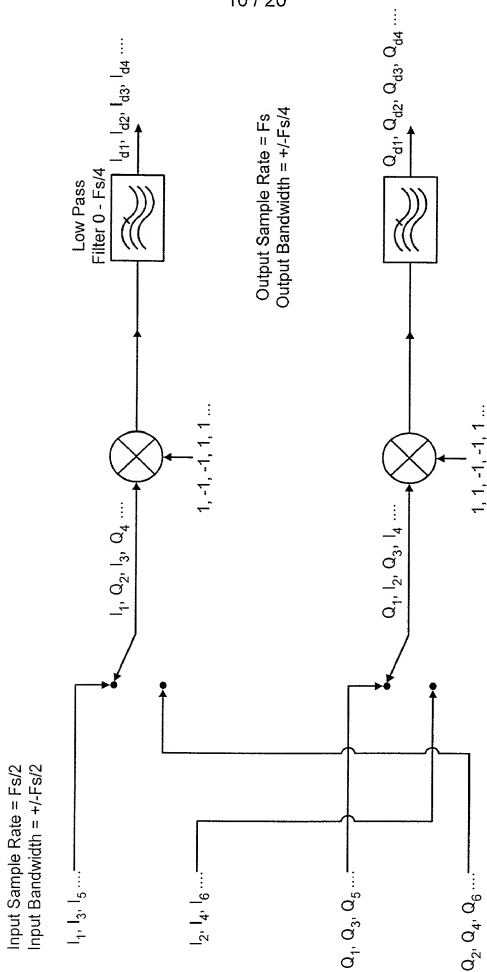


FIG.10
MODIFIED CUC(A) ARCHITECTURE

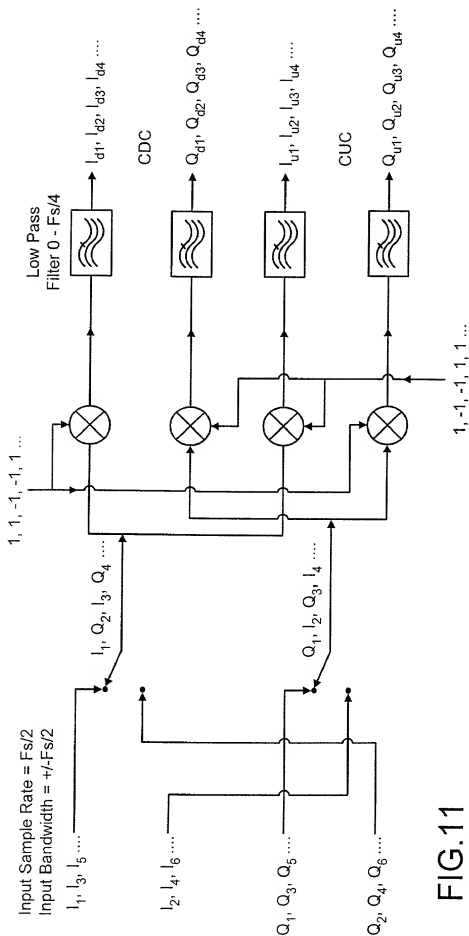
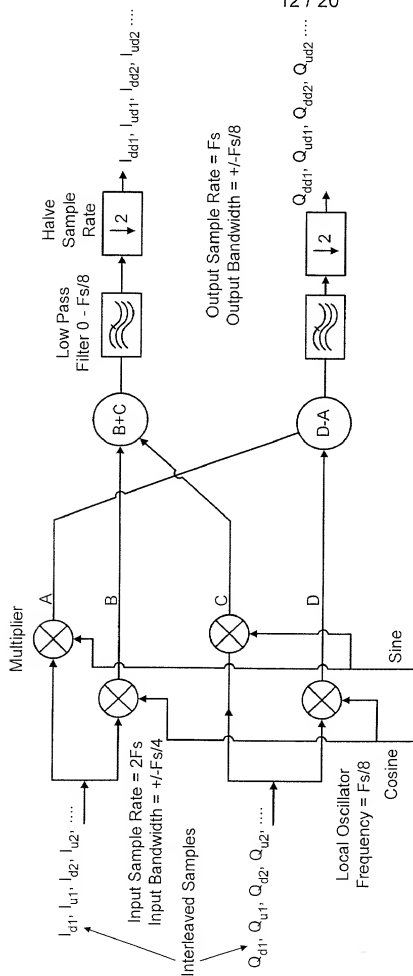


FIG.11

COMBINED CDC(A) & CUC(A) ARCHITECTURE



$$\begin{aligned} \cos_{\text{odd}} &= 1, k, 0, -k, -1, -k, 0, k, \dots \\ \cos_{\text{even}} &= 1, k, 0, -k, -1, -k, 0, k, \dots \end{aligned}$$

$$\begin{aligned} \sin_{\text{odd}} &= 0, k, 1, k, 0, -k, -1, -k, \dots \\ \sin_{\text{even}} &= 0, k, 1, k, 0, -k, -1, -k, \dots \end{aligned}$$

$$\begin{aligned} A_{\text{odd}} &= 0, kI_{d2}, I_{d3}, kI_{d4}, 0, -kI_{d6}, -I_{d7}, -kI_{d8} \dots \\ A_{\text{even}} &= 0, kI_{u2}, I_{u3}, kI_{u4}, 0, -kI_{u6}, -I_{u7}, -kI_{u8} \dots \end{aligned}$$

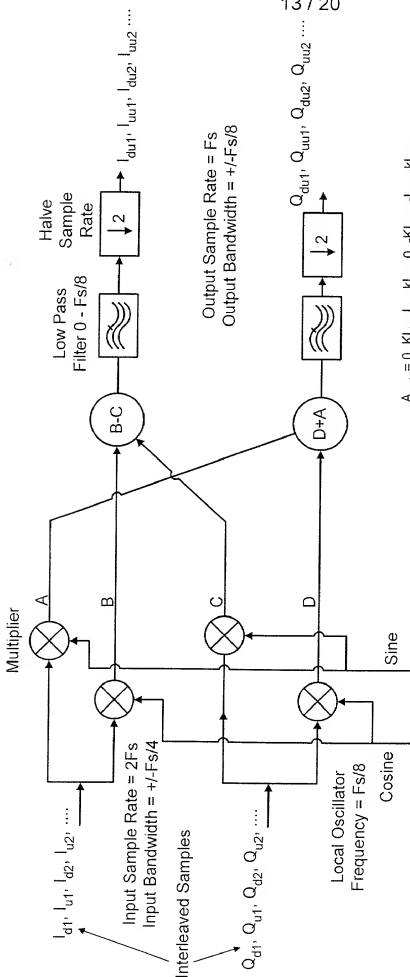
$$\begin{aligned} B_{\text{odd}} &= I_{d1}, kI_{d2}, 0, -kI_{d4}, -I_{d5}, -kI_{d6}, 0, kI_{d8} \dots \\ B_{\text{even}} &= I_{u1}, kI_{u2}, 0, -kI_{u4}, -I_{u5}, -kI_{u6}, 0, kI_{u8} \dots \end{aligned}$$

$$\begin{aligned} C_{\text{odd}} &= 0, kQ_{d2}, Q_{d3}, kQ_{d4}, 0, -kQ_{d6}, -Q_{d7}, -kQ_{d8} \dots \\ C_{\text{even}} &= 0, kQ_{u2}, Q_{u3}, kQ_{u4}, 0, -kQ_{u6}, -Q_{u7}, -kQ_{u8} \dots \end{aligned}$$

$$\begin{aligned} D_{\text{odd}} &= Q_{d1}, kQ_{d2}, 0, -kQ_{d4}, -Q_{d5}, -kQ_{d6}, 0, kQ_{d8} \dots \\ D_{\text{even}} &= Q_{u1}, kQ_{u2}, 0, -kQ_{u4}, -Q_{u5}, -kQ_{u6}, 0, kQ_{u8} \dots \end{aligned}$$

FIG.12

BASIC ICDC(B) ARCHITECTURE



$$\begin{aligned} \cos_{\text{odd}} &= 1, k, 0, -k, -1, -k, 0, k, \dots \\ \cos_{\text{even}} &= 1, k, 0, -k, -1, -k, 0, k, \dots \\ \sin_{\text{odd}} &= 0, k, 1, k, 0, -k, -1, -k, \dots \\ \sin_{\text{even}} &= 0, k, 1, k, 0, -k, -1, -k, \dots \end{aligned}$$

$$\begin{aligned} A_{\text{odd}} &= 0, kI_{u2}, I_{d3}, kI_{d4}, 0, -kI_{d6}, -I_{d7}, -kI_{d8} \dots \\ A_{\text{even}} &= 0, kI_{u2}, I_{u3}, kI_{u4}, 0, -kI_{u6}, -I_{u7}, -kI_{u8} \dots \\ B_{\text{odd}} &= I_{d1}, kI_{d2}, 0, -kI_{d4}, -I_{d5}, -kI_{d6}, 0, kI_{d8} \dots \\ B_{\text{even}} &= I_{u1}, kI_{u2}, 0, -kI_{u4}, -I_{u5}, -kI_{u6}, 0, kI_{u8} \dots \\ C_{\text{odd}} &= 0, kQ_{d2}, Q_{d3}, kQ_{d4}, 0, -kQ_{d6}, -Q_{d7}, -kQ_{d8} \dots \\ C_{\text{even}} &= 0, kQ_{u2}, Q_{u3}, kQ_{u4}, 0, -kQ_{u6}, -Q_{u7}, -kQ_{u8} \dots \\ D_{\text{odd}} &= Q_{d1}, kQ_{d2}, 0, -kQ_{d4}, -Q_{d5}, -kQ_{d6}, 0, kQ_{d8} \dots \\ D_{\text{even}} &= Q_{u1}, kQ_{u2}, 0, -kQ_{u4}, -Q_{u5}, -kQ_{u6}, 0, kQ_{u8} \dots \end{aligned}$$

FIG.13

BASIC ICUC(B) ARCHITECTURE

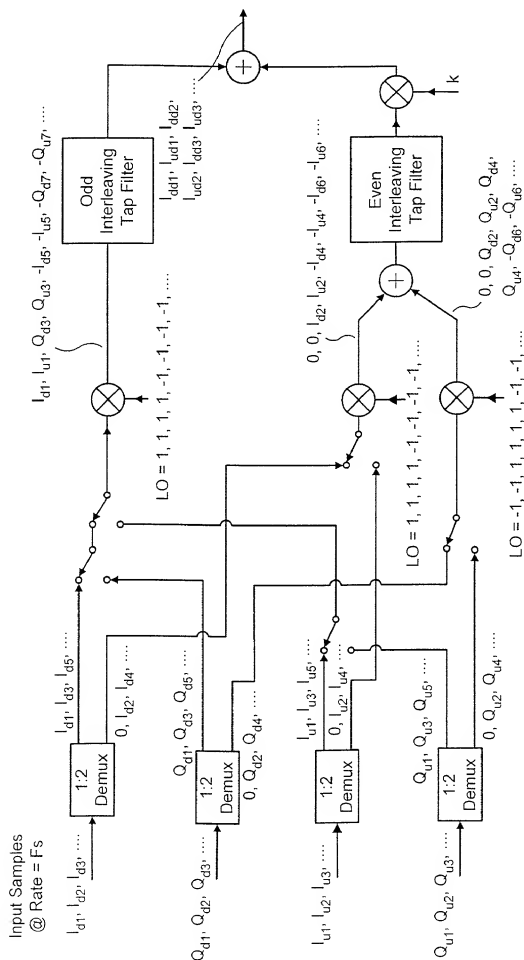


FIG.14

Simplified ICDC(B), I Channel Only

Input Samples
@ Rate = Fs

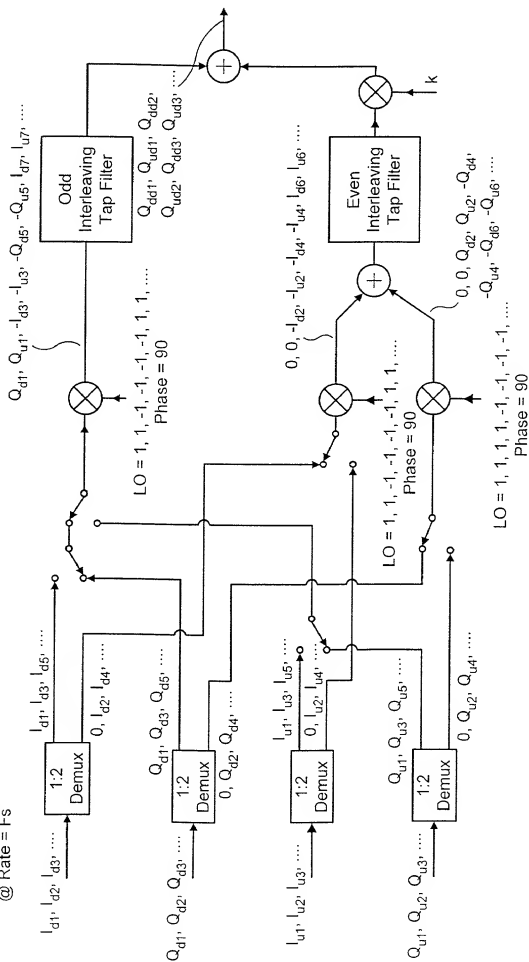
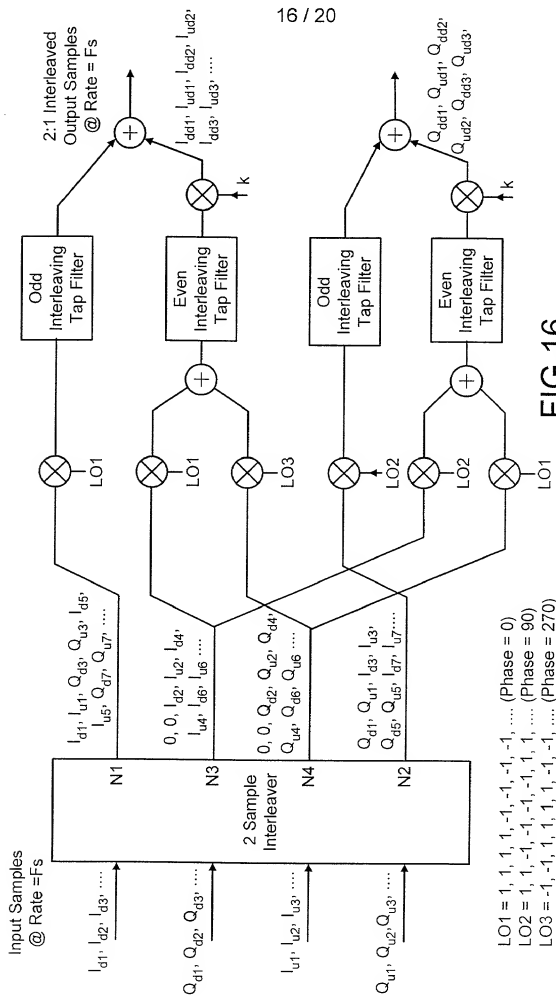


FIG.15

Simplified ICDC(B), Q Channel Only

**FIG.16**

Simplified ICDC(B), Combined I & Q Channels

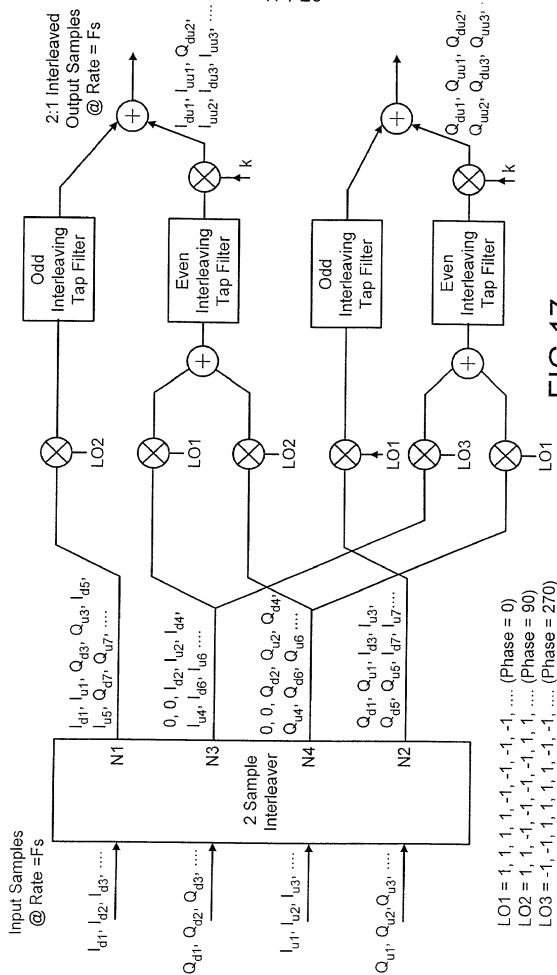


FIG.17

Simplified ICUC(B), Combined I & Q Channels

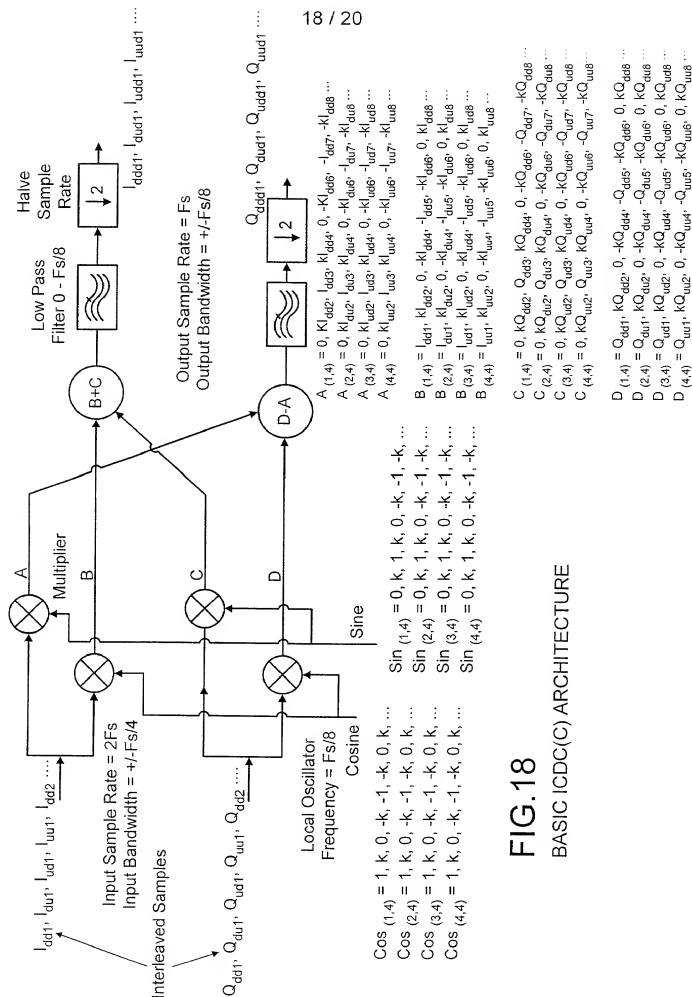


FIG.18

BASIC ICDC(C) ARCHITECTURE



Simplified ICDC(C), Combined I & Q Channels

